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THE MAGNAVOX COMPANY, et al.,

Plaintiff,

vs.

CHICAGO DYNAMIC INDUSTRIES and SEEBURG CORP.,

Defendants.

No. 74 C 1030
and
74 C 2510

BEFORE: Honorable JOHN F. GRADY, a Judge.

Tuesday, January 4, 1976

2:20 o'clock p.m.

PRESENT:

MR. ANDERSON
MR. WILLIAMS

MR. GOLDENBERG
MR. RIFKIN

THE COURT: Professor Kayton?

IRVING KAYTON,

called as a witness by the plaintiffs herein, having been previously duly sworn, resumed the stand, was examined and testified further as follows:

CROSS-EXAMINATION (continued)

BY MR. GOLDENBERG:

Q Professor Kayton, before we closed, I was directing your attention to the '507 patent, column 1, and the text commencing at about line 45 in that column. Do you have that, sir?

A Yes.

Q Do I understand your testimony correctly that that is what you characterized as an admission that the subject matter of the patent applications referred to there were prio art?

A Yes, and its location, also of course, scattered throughout the rest of the specification.

Q I understand that, sir.

Is there any statement in there or anywhere else in the patent that says the subject matter of those applications was known prior to the date of invention for the subject matter of the '507 patent?

A Yes, inferentially since it says "heretofore" in the discussion that follows.

Q But it doesn't say that directly, does it, sir?

A It doesn't say what directly, Mr. Goldenberg?

Q That the subject matter of the applications referred to were known prior to the date of the invention for the subject matter of the '507 patent.

A Those words do not appear.

Q The "heretofore", that doesn't apply to the paragraph discussing the two applications, does it? That appears in line 36 and is simply discussing the use of color and monochrome television devices, doesn't it?

A The word "heretofore" appears in the preceding paragraph. However, that part of the section labeled "Background of the Invention", as set forth in the MPP, is the part denominated prior art.

Q So you are carrying the "heretofore" down to encompass the paragraph discussing the patent applications, are you?

A I am interpreting "heretofore" to signal the commencement of the discussion of specific prior art.

Q But you can agree with me, sir, that nowhere in the '507 patent does the applicant come out and say that "the subject matter of the earlier filed application was invented prior to the date of my subject matter"?

A No, and for that matter, that was not done in

In Re Hellsund either; quite the contrary, it was based upon the examiner's construction of the words.

Q I understand, sir, and I have your view on In Re Hellsund and I will address myself to that at the appropriate time.

The same is true, is it not, in the references in the application for the '284 patent. There is no expressed admission that the subject matter of the applications for the '480 was invented prior, is there?

A No, those words do not appear on that, just as they do not appear in the '507, which was the re-issue.

Q That is true of the application for the '285 patent?

A Yes.

Q That is true also of the application for the '598 re-issue patent, is it not?

A Yes.

Q Now, do you recall, sir, this morning when I inquired about the examiner's use of three references to make a rejection during the pendency of the application for the '284 patent?

A Yes, I recall that discussion.

Q I would ask you to turn to the applicant's response to that rejection.

A I'm afraid I don't have that. I cleared the table at the close, and I don't have any of the file histories, file wrappers.

MR. GOLDENBERG: It's a paper, your Honor, which has got 9/C.

THE COURT: What exhibit is that? 2-A?

MR. GOLDENBERG: 2-A.

THE COURT: 2-A. And it's got what?

MR. GOLDENBERG: 9/c at the top. It follows that paper number 6 in the file.

THE COURT: All right. Where is the response? Oh, you said 9/c --

MR. GOLDENBERG: -- is the beginning of that response to that rejection, your Honor. It commences here (indicating).

THE COURT: Okay. Thank you.

THE WITNESS: Are you referring to page 15 of that amendment, to the remarks, or the first

page of it?

BY MR. GOLDENBERG:

Q Well, I want to direct your attention to page 23. Perhaps you could explain what a response to an office action is. Perhaps you have already done that, but in responding to an office action the applicant sometimes amends his claims, does he not?

A Yes.

Q And if we look at this response right here, the first part of the response is in fact an amendment of the claims, is that correct?

A Yes. Some claims are amended. I don't know how many. Claims have been amended, yes.

Q Then accompanying that amendment are certain remarks, and those begin on page 15 in this case, don't they?

A Yes.

Q In the remarks the applicant explains, tells the examiners what he is doing and makes his argument as to why he distinguishes over the prior art, and that sort of thing, if that's what he has to do, is that correct?

A Yes. That's one of the things.

Q And that's the case with this document we are looking at right now, isn't it?

A What is the case? It's a typical --

Q It's a typical response --

A Response.

Q -- to an amendment, accompanied by remarks wherein the applicant or his attorney explains to the examiner what he has done and makes arguments as to why claims should be allowed if they have been rejected?

A Yes.

Q Would you turn to page 23.

A Yes, I have it.

Q All right, sir. About half way down that page the following appears:

> "Althouse is merely directed to the positioning and display of small rectangular spots on a CRT raster display representing coordinate data. He only moves the spots around to position them and he never has any cooperation between plural spots."

Have you studied the '480 patent enough to know whether or not that patent has any cooperation between plural spots?

A No, I did not study any of the material from the point of view of what is technically shown.

Q Well, if you can assume that the '480 patent does have cooperation between plural spots, should the applicant here have argued that to be a difference over Althouse, when he knew that it was not his invention but rather was the invention of the '480 patent?

MR. ANDERSON: Your Honor, I object, because of the inference of the hypothetical in this specific context and the mixing of hypothetical and specific facts, and also it is taking one sentence out of context for a witness who doesn't

know the specific facts. And I think if the document is looked at in its whole, it gives somewhat of a different total picture.

THE COURT: Overruled.

THE WITNESS: Okay. Would you repeat it now?

MR. GOLDENBERG: Would you read the question back?

Q (Read by the reporter.)

BY THE WITNESS:

A Well, I will respond, as you correctly pointed out, this was a rejection on 103, obviousness, in which several references are relied upon.

When you have such a situation the response has to be based upon the relationship of all of those references to each other, unlike a Section 102 rejection. I would have to understand what the technical relationship -- the technological relatinnships between those prior art references are to each other in order to understand it.

It's simply not possible for me to say yes or no to that, without knowing everything about the relatinnship of those references. It is -- well, I don't know what else to say. I think I have responded.

Q All right, sir.

THE COURT: Are you leaving that, Mr. Goldenberg?

MR. GOLDENBERG: I hadn't quite decided, your Honor, whether or not I was. Does the Court have a question?

THE COURT: I wanted to ask a question if you were through.

MR. GOLDENBERG: Go ahead, your Honor.

THE COURT: I think the thrust of Mr. Goldenberg's question is whether by making this argument, the applicant was implying that cooperation between plural spots was novel. I think you can answer that without regard to the technology involved but simply on the basis of your understanding of how patent lawyers argue.

THE WITNESS: That is what I am trying to do, and I understand that, your Honor.

In a Section 103 on obviousness rejection, a typical response would be because of the nature of one structure, the other structure which you are trying to combine with it to render the claim invalid can't really be combined because they function differently. You can't put them together.

So it doesn't get to the question, as you

would in a 102 anticipation, is it novel or is it not because there are in fact many basis for the response. For example, he says he only moves the spots around to position them and he never has any cooperation between plural spots.

Now, I don't know whether that has to do with novelty or is it the predicate for other things? In order for me to know that, I would not only have to read the specific language in these remarks, I would have to know the technology.

BY MR. GOLDENBERG:

Q Dr. Kayton, is there any information provided in the preceding paragraph, which reads as follows:

"Once again, applicant deems the claims as amended and currently remaining in the application as patentable over the references of record, taken singularly or in combination."

Then what we have following that --

THE COURT: Excuse me just a minute.

(There was a brief interruption, after which the following proceedings were had herein:)

BY MR. GOLDENBERG:

Q Dr. Kayton, my question to you is if you take the preceding paragraph, which I read, it says to me that the applicant is now going to discuss each of the references

singularly or in combination. Indeed, if you read on, I believe you will see that is what happened.

Isn't he now saying that "Althouse is no good because he doesn't have that feature and that is a feature I invented"?

A No, absolutely not. This is a typical statement an attorney would make, the sense of which is as follows:

"Since we have a combination of references as a rejection and I argue," he is saying,"that the claims distinguish over all of them together, then the claims distinguish over each a fortiori," and that is a standard statement.

In essence if it took all of this to launch against the claim and the claim is unobvious over all of this then a fortiori, it is unobvious over them individually.

Now, that is a typical expression. It is one that I have used many times.

I have not read this in that context to know whether specifically he used it in that sense, but that is a common way of doing it.

Q Can you agree that in the next five paragraphs that follow, he discusses certain references cited by the examiner on an individual basis?

A Yes, for laying the foundation for the discussion of the nonobviousness of the claims over the interrelationship of those references, which is also typical.

Q Is there any discussion there by the attorney as to why the combination of references, as proposed by the examiner, cannot be made?

A Shall I read it?

Q Yes, sir.

(There was a brief interruption, after which the following further proceedings were had herein:)

BY THE WITNESS:

A Keeping in mind that I am handicapped by a lack of intimate knowledge of the technology, the answer to your question is that yes, he is doing that. What he is doing is showing how specific components vary from specific things set forth in the claims such that when you put the whole together, you don't have the claimed invention.

That is how I understand it, but as I say, I would have to have a better understanding of the tech-

nology to be sure.

BY MR. GOLDENBERG:

Q All right, sir, just to close this matter off, if you turn to page 24 --

A Yes, I am on it.

Q He discusses the Evans and Goldsmith patents, doesn't he?

A Yes.

Q A distinction he asserts over the Evans patent is that there is no interaction by the viewer with a standard television set. That is paraphrased, but would you agree with that?

A I will read it.

It says that, "There is no interaction by the viewer required or possible in his scheme."

Q That is whatever Evans' scheme was?

A Yes.

Q You say you don't know whether that interaction was part of the '480 disclosure or not, I take it?

A Cooperation with the TV screen?

Q Yes,

A Yes, I recall that there was a TV set there.

Q So that was part of the application for the '480 patent; you know that?

A The TV screen?

Q Yes.

A Yes.

Q An interaction with the TV screen?

A There were electrical circuits connected to a TV screen, yes.

If you want to know, my understanding of what he is saying here is that as far as we can understand --

Q No, sir, I would rather have you answer my questions.

A Fine, yes, I will be happy to.

Q In the next paragraph he discusses the Goldsmith patent, doesn't he?

A Yes.

Q He tells the examiner that the device he is seeking a patent for operates in the TV raster mode, isn't that correct?

A Yes, the last part of the paragraph says that.

Q Do you know whether or not that was true of the application for the '480 patent?

A The TV raster, yes.

I would like to amplify that.

Q Surely.

A It is the case that everything is made up of a combination of other things. And this is a typical way of saying that you cannot select parts from different parts of the universe of the technology and put them together without some inherent teaching to do so, other than the applicant's teaching, and he was saying you can't take a nut from here and a bolt from there and a screw from there and a widget from there, put it together and allege that my invention is non-obvious, unless you can find out in the prior art a teaching that says, "Put these kinds of things together", and that is a typical and appropriate way to do it.

Q And you argue that way when you lay claim to them yourself as your invention, don't you?

A Argue what?

Q The way you just described.

A No, not at all. You claim them in their interrelationship.

Q That's what I mean. You claim them as your invention, don't you? So when you are making that kind of argument, you are saying, "I'm the fellow who put these things together".

A "I am the fellow who recognizes that they could be put together for the unexpected result which I have produced."

That's what non-obviousness means.

Q All right. Now, in the course of your testimony

describing the procedure in the Patent Office, you indicated that there were a number of things, procedures, that the examiner was charged to follow, is that correct?

A Yes.

Q I don't want to go over all that, but these procedures are established by the rules of practice, the patent statutes and the Manual of Patent Examining Procedure.

A Yes.

Q Do you have any affirmative evidence that this examiner did all that he was charged to do?

A I have no demonstration that he did what he was charged to do. My position is that if he was acting responsibly, he would have.

Q All right, sir. Do you have a copy of the rules of practice available to you?

A No, I don't, not before me.

Q I hand you a copy of those, and I direct your attention to Rule 75, particular paragraph D.

A Yes.

Q Could you read that rule, sir?

A "D.1. The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description, so that the meaning of the terms in the claims may be ascertainable by reference to the description."

Q All right.

A "2. --"

Q Perhaps -- let me see if the rest of it --

A It says:

"See 141 and 146 as to claiming different inventions in one application."

Q Oh, all right. D1 is what I have reference to.

Is there any antecedent basis in the specification of the '507 patent for the phrase, "Distinct motion"?

A I cannot say for sure. I cannot respond to that.

Q Isn't it one of the things that the examiner is charged to do, is to insure compliance with the rule?

A Yes.

Q And do you know when the phrase "Distinct motion" came in to the application during its history?

A I do not.

Q If there is no antecedent basis for that phrase, has there been a compliance with that rule?

A Yes, if it's used as a common English word. This makes reference to structure that is claimed, using word for structure that is claimed, which is not supported in the specifications. And if it is supported, either with the use of a word or if the structure disclosed does what the word says, then antecedent basis is included.

Q So it's only if "Distinct motion" is used as a common English word do you find compliance with the rule, is that correct?

A What I am saying is if it's used as a common English word and the structure disclosed does what that word says, then it's complied with, yes.

Q All right, sir.

A You see, when it says "Conform to the invention and find clear support or antecedent basis in the description," it is talking about the totality, the words, the drawings, and what a person of ordinary skill in the art would understand from that disclosure

the device would operate like.

That wasn't phrased too well.

Q In your direct examination you make reference to the practice of granting interviews, and reference to a section of the Manual of Patent Examining Procedure. Do you remember that?

A Yes.

Q Was that Section 713.02?

A 713.02. The first paragraph talks about meetings, not interviews, prior to the filing of an application, and indicating that nothing by way of interview that would take place after an application would take place before an application is filed.

Q Do you have any knowledge as to whether or not there was any interview with the examiner before the applications for the re-issue application were filed?

A I know that in -- I think it was a request for admissions that I read -- it was admitted that there was a meeting with one of the attorneys and the examiner; not an interview, at least as far as the request and the response characterized it.

Q What's the difference between a meeting and an interview?

A Oh, well, an interview is a term of art. In Patent Office practice, it is an interchange between -- it's a physical interview and an interchange between the examiner and attorney with respect to a pending application in which the attorney wants to present certain views for the examiner's consideration. That is an interview.

Q And if it's held before an application is pending, it's called a meeting?

A Well, if the interchange between them is of the

type where he is in fact arguing an application not yet filed, that would be a proscribed interview. But if it doesn't take the nature of that -- what's the word -- attempt to advance the prosecution of the case in favor of the applicant, then it's not an interview as such. It is -- well, it's exactly what it said here, for example, in that first paragraph. They may meet, and it's indicated that to get the help of the examiner, for example, to determine where he might search for prior art, is perfectly okay, within the discretion of the examiner, of course.

Q All right, sir. So you were made aware of a meeting with the examiner before the applications for the re-issues were filed, is that correct?

A Only through the requests for admissions.

Q All right, sir. Did you make any inquiry as to what was said or done at that meeting?

A No.

Q Would it be your testimony that if that meeting went beyond --

A I'm sorry?

Q Would it be your testimony that if that meeting went beyond mere inquiry about a field of search, it would be in violation of the practices of the Patent Office?

A No. As long as it was not an interchange trying to gain an understanding about the prosecution of an application,

it's not an interview and would not be proscribed.

Q Suppose at that meeting the examiner were presented with a sample or specimen of claims that you intended to file. Would that be proscribed?

A That had not been filed?

Q That had not been filed. No application had been filed.

A Pardon?

Q No application had been filed. It was intended to file one, and before it was filed the examiner was given a sample of the claims that were going to be filed.

A Well, barring any other facts, I would consider that likely to be an interview.

I could imagine mitigating circumstances, but my first-blush response would be that that was not the meeting, because he was -- at least, it's suggestive from those facts, and nothing more, that he was going to argue the case.

If he was not going to argue the case, then I would have to know more facts.

Q Therefore if that be so, it is proscribed and the examiner was not doing that which he was charged to do, is that correct?

A If it were an interview of the type that I said, he should not have done that, right.

It is not the kind of thing, of course, that would in any way upset the prosecution history at all, unless it really was an interview and he didn't record it. That certainly would have to be the case.

Q In your direct examination you made reference to an interference search.

A Yes.

Q Could you state what that is?

A Yes, an interference search is a search of pending applications which must be undertaken prior to the issuance of a patent but which is also undertaken from time to time through the prosecution of the application to determine whether or not there are applications co-pending claiming the same patentable subject matter, such that if that does occur, the Patent Office would be in the position to set up the mechanism for an interparties proceeding to determine who was the first inventor among the two or more applicants.

Q Is there a section of the Manual of Patent Examining Procedure which discusses that topic?

A Yes, I believe I made reference to it yesterday.

Q I think it is 11 --

A 1101.01(c), entitled "The Interference Search."

Q Could you read the first paragraph of that section of the Manual?

A "The search for interfering applications must not be limited to the class or subclass in which it is classified but must be extended to all classes in or out of the examining group which it has been necessary to search in the examination of the application."

Q Do you still have Plaintiff's Exhibit 2-A available to you?

A Yes.

Q Could you turn toward the end. It would either be the last page or the next to the last page.

A Yes.

Q Do you have the page that has a column headed "Searched"?

A Yes.

Q Below that it says "Interference Searched"?

A Yes.

Q Could you state what those are, sir?

A In the "Searched" tabulation, there are four

class, subclass relationships, 340/324(a), 315/22, 178 -- I think it is 178/6.8, 340/324(a).

Then in the "Interference Searched" category, it says Class 340/324(a).

Q Would it be correct, sir, that the classes and subclasses entered under "Searched" are those portions of the Patent Office technology that the examiner searched during his examination process of the application?

A Yes, that is what it is supposed to represent.

Q In the class and subclass entered under "Interference Searched" that class and subclass entered is what he searched when he made his interference search, isn't it?

A That is certainly what he would put, yes.

Q In that case the examiner did not do what he was charged to do, did he, by the section of the Manual we just read?

A I don't know that he did not. He did not record it.

He may have done it or he may not have.

Q I see, sir. In any case, it is not recorded there that he did that, is it?

A No, it is not recorded. If he acted responsibly, he would have searched it whether he recorded it

or not.

Q You have no evidence that he acted responsibly, though, do you?

A I have absolutely no evidence that he acted responsibly.

In fact, in the adjacent courtroom, Judge Marovitz precluded me from ever saying "If a Government official acted responsibly." I started to say, "If he acted responsibly," and he said, "Professor Kayton, all Government officials act responsibly unless the other side demonstrates categorically that he did not."

Since then I have been a little loathe, but in order to keep the integrity of the testimony, I am trying it again.

Q All right, sir. I direct your attention to Plaintiff's Exhibit 2-B. Do you have a copy of that, sir?

(There was a brief interruption, after which the following further proceedings were had herein:)

THE WITNESS: Yes, sir, I have it now.

BY MR. GOLDENBERG:

Q Again I direct your attention to the next to the last page.

Would you agree that once again, according to that record, the only class or sub-class interference searched was 340, subclass 324, and this is even though the examiner recorded a much greater number of classes and subclasses in the area in which he searched?

A That is the only class indicated in the index "Searched" table. That is all I can say.

THE COURT: Will you refresh my recollection again as to what you search on an interferences search? Is this a search of the pending applications that have not yet resulted in patents?

THE WITNESS: Yes, that is correct, to see if an inhouse interparties determination of priorities should be undertaken.

THE COURT: Had the examiner gone and physically read the '480 patent, would that have been considered an interference search?

THE WITNESS: No, it would not have been because it was a common assignee and it would not be an interference between applications of a common assignee, but what he would have had to have done is to require the

common assignee to choose which one was the first and reject the other claims over it. So it would not be in that category at all.

BY MR. GOLDENBERG:

Q Mr. Kayton, I direct your attention to Plaintiff's Exhibit 2-D, which is the file wrapper for the re-issue patent '598.

Now, sir, if I understood your testimony in response to questions from Mr. Anderson, I believe it is generally to the effect that upon the filing of a re-issue application, that at least a part of that examination is to conduct the same kind of examination that has been conducted previously with respect to studying claims, making searches, and all of those elements which have been done before have to be done over again, is that correct?

A What I testified to was that it is an examination de novo. Anything that was done before can be done again.

It does not mean that it was done again, but it could be, and if it is a valid basis for rejection, you will have it rejected again.

Q If you will turn to the next to the last page of Exhibit 2-D and look under the heading "Searched" is there any indication there that the examiner searched the same classes and subclasses that he had searched before in connection with that patent?

A I just handed back the file history of the other one, so I can't compare them.

(There was a brief interruption, after which the following proceedings were had herein:)

THE WITNESS: I now have all the file histories. We were looking at which one before, Mr. Goldenberg?

We are looking at 2-D now. Which was the one you wanted me to compare it to?

BY MR. GOLDENBERG:

Q 2-B, so you will be comparing 2-D and 2-B.

A Yes, I have that, and classes in 2-B include the two searched in 2-D and several more.

Q So when he had the application for the '285, his search was much more extensive than it was when he had the re-issue application, isn't that correct?

A Yes.

Q In the searched records for the re-issue application, there is no indication that he searched Class 178, subclass 6.8?

A That's correct.

Q At the time that the re-issue application was filed, the '480 patent had issued, had it not?

A Yes.

Q So if the examiner had searched 178/6.8, he would have found that patent in that search, wouldn't he?

A Oh, yes, he would have found the very patent the application to which was called to his attention in the specification.

Q But there is no record that he ever made such a search, is there?

A Oh, no.

Q Isn't the same true for the application which resulted in the '507 re-issue patent, and here I would direct your attention to Exhibit 2-A and 2-C?

A Yes, I have them.

Now, isn't what the same?

Q There is no record that when the re-issue case was pending, the examiner first searched all the classes that he had previously searched, and second, that he did not search the class in which the '480 patent was now residing as an issued patent?

A Unfortunately, Plaintiff's Exhibit 2-C does not have the requisite page for me to compare. 2-A does.

MR. ANDERSON: That appears to be true of all the copies we have.

MR. GOLDENBERG: Your Honor, I have here a document that we have marked as 2-C. It is a certified copy, as witnessed by the blue ribbon and seal.

With Mr. Anderson's permission, and I will show it to him first.

MR. ANDERSON: Yes, I appreciate it.

BY THE WITNESS:

A Now I have it in front of me and I am looking at the table designated "Searched" for the '507 patent. I am also looking at the table designated "Searched" for -- well, I am looking at Plaintiff's Exhibit 2-A. I can't read the numbers at the top.

I am looking at Plaintiff's Exhibit 2-A and the file history of the '507 patent. Is that what I am supposed to do?

BY MR. GOLDENBERG:

Q Yes, sir, if you would.

A The records of "Searched" for the '507 patent lists one subclass and one class, and one class with a different subclass of the '507 is also listed in the "Searched" column of Plaintiff's Exhibit 2-A.

There are other classes so listed.

Q There is no record that when the re-issue '507 was pending, the examiner searched Class 178, subclass 6.8, is that right?

A There is no record of that. My answer is exactly the same as for the preceding.

THE COURT: Would the issued patents have been a proper reference on the reissue application, had the patent by now been issued?

THE WITNESS: Yes.

THE COURT: Do we know what the date of issue was in relation to the date of the filing?

MR. GOLDENBERG: The '480 patent issued as a patent on April 17, 1973. The application to reissue the '284 patent, which became the reissue '507 patent, was filed on April 25, 1974, a little over a year later.

The same is true of the application to reissue the '285 patent, which became the '598 reissue. That too was filed on April 25, 1974.

THE COURT: Thank you.

MR. ANDERSON: I am not certain of the Court's question, but I guess it's perhaps clear from the answer that the '480 patent could not have been a reference against either the '284 or '285 patents.

THE COURT: My question had to do with the reissue.

MR. ANDERSON: But as to the reissue patents, the '480 patent reissued on April 1973.

THE COURT: It could have been cited. That is correct.

MR. ANDERSON: As a reference

BY MR. GOLDENBERG:

Q Professor Kayton, I gather, since I just took it back from you, you no longer have a copy of Exhibit 2-C available to you, is that correct?

A No, I have 2-C. I have 2-C. Yes, I have 2-A, 2-B, 2-C and 2-D.

Q All right.

A The problem was that 2-C did not have that last -- the next to the last page with the search table.

MR. ANDERSON: Just for the record on that point, your Honor, I understand that the new 2-C that's been brought in by Mr. Goldenberg comes from the attorneys for Midway, Mr. Welsh, and that's where we ran our copies, and I regret that that page turned up missing. But they were run from the same source.

MR. GOLDENBERG: I gather that we have the one that has the ribbon on it, the ribbon copy.

MR. ANDERSON: You have the ribbon copy of Sanders Deposition Exhibit 48, as it showed on our copies and on the one that you have just brought in.

MR. GOLDENBERG: All right.

BY MR. GOLDENBERG:

Q Mr. Kayton, do you find that -- I'm sorry, Professor Kayton, do you find any indication in Exhibits 2-C and 2-D, the Patent Office history of the '507 and '598 reissue patents, that the applicants called to the attention of the examiner any prior art?

A Yes. I have spent a long time talking about how the specification did do that.

Q Do you find any indication other than that, sir?

A Let me make sure I know which file history we are talking about.

Q All right, sir.

A The '507 are you talking about?

Q Let's take 2-C for the '507, and there is a document in there entitled "Citation of References", and it would seem to be paper number 6 in the Patent Office scheme of numbering.

A Well, I know that there was a calling to the examiner's attention of prior art that had not been considered.

Q In that document --

A I don't have it.

Q I'm sorry?

A That's my problem.

Are we talking about number 6, "Citation of References"? Yes, in that paper the applicant's attorney called to the attention of Mr. Trafton, the examiner, U.S. Patent to Hermann, to Doba, to Glaser, and a French patent.

Q In that document do they advise the examiner that the application they had earlier referred to was now an issued patent, namely, the '480 patent?

A They do not. I mean he did not.

Q He did not.

A If I recall correctly, these were the references that were called to the plaintiff's attention by the defendants in the preceding litigation.

Q Do you know of any other references which were called to the plaintiff's attention in the litigation?

A No. I just have a recollection that these were references called to the attention of the plaintiff.

Q If such references beyond those indicated had been called to their attention, would it have been a proper course to call the Patent Office -- call the attention of the Patent Office to those references also?

A Well, if they -- if the references were not already called to the Patent Office's attention and the applicant -- the plaintiff considered it equally more pertinant than the other prior art, yes.

But otherwise, no. You don't call references to the examiner's attention which are not as pertinent as art already considered, which the examiner has already considered.

Q Well, suppose you had a reference which detected true coincidence of two displayed symbols?

A Mr. Goldenberg, you are asking a question that I have no basis -- I mean I don't know what the question

is, but it's in terms that I will have no basis from which to answer.

Q All right, sir. In the paper that we are presently looking at, the patent to Hermann, which was called to the attention of the Patent Office, on page 3, at the top of the page --

A Are we back to the citation of references?

Q Yes, sir. This is in this paper number 6.

A Yes, okay. Page number 3.

Q "Specifically, it should be further noted that the Hermann apparatus purports only to detect when the target and missile symbols are at the same altitude, that is, at the same vertical location. No effort is made to detect when the symbols are also at the same horizontal location. Thus again Hermann does not detect true coincidence of two displayed symbols."

Now, if that were something worth distinguishing, and you knew of something which did that, shouldn't you call that to the examiner's attention?

A Mr. Goldenberg, it has to be something that distinguishes from claims in order to determine it. All I see here is a list of one, two, three, four patents, and a characterization of them which I do not understand, in no relationship to any specifics other than in one

place he talks about some of the broadest claims do something, and farther on he talks about Claim 43.

Q All right.

A I just -- I don't know how to respond to your question. I will do my best otherwise.

Q All right, sir. It may not be capable of response, and I accept that.

With respect to the reduction to practice that you testified about which took place in the facilities of Sanders in June of 1967 --

A You mean it was called to my attentionn?

Q Called to your attention, sir, as a result of the testimony that you heard there of that kind of thing.

Was the examiner made aware of the fact of that reduction to practice?

A That there was a physical reduction to practice, I have found nothing to so indicate.

Q He was never told that there was a demonstration of that nature or anything about it, was he?

A No, I did not find anything like that.

Q With respect to reduction to practice of the subject matter of the '284 patent and its re-issue, '507, is there any indication that the examiner was ever told about the fact of that reduction to practice?

A I have found no such indication.

Q I think perhaps I attempted to answer that question for the Judge earlier and perhaps didn't do a satisfactory job, sir, but could you explain what mechanism if any exists for applicants to bring to the attention of the Patent Office prior art which is not in the form of prior patents or printed publications or that kind of document? Is there any procedure to permit that to be done?

A He can disclose it in the Remarks section of an action. Or he can do it, I suppose, in affidavit, but I don't know that an affidavit would be necessary.

Q I have done it in the form of affidavits.

A Well --

Q But an affidavit could be submitted, could it not?

A Yes. Those would be another category of Rule 132, affidavits.

Q And the Patent Office would then have an opportunity to assess the legal significance of this submission, whatever it may have been?

A Well, they would have an opportunity to do whatever they feel appropriate.

MR. GOLDENBERG: Your Honor, I have no further questions.

REDIRECT EXAMINATION

BY MR. ANDERSON:

Q Professor Kayton, do you still have Exhibit 2-A, the '284 wrapper on the rostrum, the witness stand?

A Yes, I do.

Q Would you turn to page 2?

A Is this the '284? It's blank. Is this '284?

Q The '284 file wrapper.

A Okay. 2-A is the '284.

Q 2-A, yes.

Turn to that paper number 6, dated -- I can't read the date, but it's a responsive office action to an amendment filed November 24, 1970, and it just precedes in the file the first clip, I believe.

A Paper number 6?

Q Paper number 6, an office action.

Mr. Goldenberg asked you several questions about the second page of paper number 6.

A Okay. This is the office action, and we are on the 2nd page of it.

Q Right. I believe in that 2nd page the examiner rejected approximately 50 claims. I haven't actually totaled the number, but approximately 50 claims based on 35 USC 103,

citing 6 different U.S. patents.

Can you describe that, the practice that produces that kind of an office action, please?

A Yes. This is typical office action when you are dealing with an invention and an application for an invention that has many, many claims and much disclosure, and wherein the claims are necessarily varied in many different ways, to comprehend the various aspects of the invention. It is a typical way for the examiner to lay out what is some related art, and to elicit from the attorney a response calculated to demonstrate how the attorney believes these claims are inventive and are related to the art. It's a way of narrowing the issues and placing the burden on the attorney to respond to the overall amalgam of prior art that's presented.

Q Does the rejection of the type shown at page 2 of paper number 6 indicate that the examiner found that all six of the mentioned patents had to be combined in order to reject under 35 USC 103 each of the many claims listed?

A It's not clear to me what the question is, Mr. Anderson. I wasn't listening fully.

Q I'm sorry. Mr. Goldenberg asked you about the combination of various references in rejecting claims under 103, and I have now asked the question with respect to each of the claims that the examiner has listed at the top of page 2 of the paper number 6, and there are in excess of 50 claims listed there.

A Yes.

Q Is the format of that paragraph an indication that the examiner felt that he must combine all six of these patents --

A Yes.

Q -- in order to constitute a proper rejection of each and every claim, or something else?

A No, that's not at all the case. What he is saying is, here are these 60 or so claims, and they are rejected as unpatentable over Althouse, and so on and so on and so on and so on, meaning that in essence, that some of them would be in relationship to some of the claims but not necessarily all of them have to be combined for each claim.

Q Then, for example, the examiner in about the 8th line of that paragraph at page 2 of paper number 6 in Exhibit 2-A states that:

> "While sinusoidal type circuitry is shown, it will be obvious to substitute sawtooth waves, as taught by Moffat and Ragan."

Now, do you know enough about the technology that is involved to state whether all of the claims in suit required specifically sawtooth waves or sinusoids?

A Well, the claims that I read did not recite -- the 25 and 51, if I recall correctly, do not recite saw-

tooth waves, if I recall.

Q Well, then, would the citation of Moffat and Ragan here be for some -- presumably for some other claims other than the broadest claims, or the claims that wouldn't recite that?

A Oh, yes.

Q Then would that be true with respect to other recitations in the paragraph at the top of page 2, such as the indication, for example, that I believe the Evans patent teaches modulating a signal onto another signal for use with TV antenna terminals? Would that apply necessarily to all of the claims listed above, or less than all of them?

A Well, I don't really know, you know, whether that statement about teaching modulating is something that is inherent in the two claims that I read. I would guess that it's not, but I could not say for certain.

There is a line there that says, "Obvious to employ image reversal to the Althouse display as taught by Keesling, Figure 36."

And I have no recollection of Claims 25 or 51 talking about any kind of image reversal, or requiring that. So --

Q Mr. Goldenberg has raised an inference in his cross-examination of you that because the '480 application was not specifically referenced, it was not considered by the examiner. Is the inference equally likely that he considered the claims of the '480 application and found the other applications unobvious in view of that?

A Yes, sir, it is equally likely.

Q With respect to the claims of --

A Well, let me qualify it. I would say it is more likely since he was charged with considering that prior art. I would say much more likely.

Q With respect to the claims of the '284 patent, is it also equally or more likely that he considered them and found them wanting with respect to the '285 patent application, rather than the inference that Mr. Goldenberg raised, that they were not considered?

A Yes, for exactly the same reason, I would say the inference is more likely that he considered the '285 unobvious over the '284 rather than he didn't consider it because it is a very important obligation that he is under.

Q If he acted responsibly, did he consider those applications and the claims of '480?

A If he acted responsibly, he did consider them.

Q Professor Kayton, you pointed out that the '480 patent application is referenced in all four of the patents,

the '284, the '285, 'the 507, and the '598 patents, at two very specific places at column 1, first at the top under "Related Applications" and a second time under the paragraph "Background of Invention".

What reason or reasons exist why that reference to the '480 application would be specifically included at both of those places?

A The first reference is one put in by the examiner, and it virtually speaks for itself. He says that this invention relates to the subject matter disclosed. He therefore considered the '480 application subject matter related to the applications being considered.

The reference put in the second part of the "Background of Invention" was put in by the applicants, and that is an indication of what the applicant considered to be prior art in that part of the specification.

THE COURT: Would there in your view be likely to be a discussion in the file somewhere by the examiner of the '480 patent had he considered it? I am not talking about a discussion and a description of the patent. I am talking about something that is authored by the examiner himself.

THE WITNESS: Only if he considered claims to be obvious and, therefore, unpatentable. If he considered them to be patentable, he would not discuss it.

THE COURT: If he felt that there were at least an issue posed by the '480 patent and, therefore, that it should be distinguished, would it be customary for him to state how it is distinguished?

THE WITNESS: No, that is one thing an examiner will not do. He will not explain the reasons for his allowance of claims. It is not done and it is never done.

There is a proposed change to the rules being considered wherein the examiner may do that if it is not clear what the basis for allowance is from the sequence of the file history, but he simply does not do that. He never explains why he is allowing anything, and we are necessarily required to follow through the file history by logic, and the rules of logic are determined by the Manual of Patent Examining Procedure, the rules and statutes, and the cases that impinge, such as, more specifically, In Re Hellsund and the subsequent cases that have been reaffirmed In Re Hellsund.

BY MR. ANDERSON:

Q Professor Kayton, would you please turn now to page 24. I think that is actually a tab in the file wrapper of '284 patent. It is probably the third tab.

A You have to give me the exhibit number.

Q Exhibit 2-A, '284 file wrapper, page 24 of the amendment, which has been referred to before as --

A I turned to tab 4, and now what am I supposed to --

Q I thought it would be tab 3 actually. It should be page 24.

A Okay.

Q What I want you to turn to is page 24 of Amendment B in the '284 file wrapper. Have you found that?

A Yes.

Q On page 24 you were asked several questions by Mr. Goldenberg and you asked to give your understanding of, I believe, the first full paragraph on that page. Mr. Goldenberg indicated that he did not want your understanding.

I think maybe you also gave that understanding subsequently, but if not, I want to give you the opportunity to give your understanding of the paragraph, which begins "Evans, et al might suggest," and I think specifically the question related to the statement by the applicant "There is no interaction by the viewer required or possible in his scheme."

A That specific language -- and I am really glad you called my attention to it -- is precisely the kind of thing that shows or illustrates the point that I was making.

Here the applicant is saying "Evans shows this." In the claimed invention, something like Evans must relate to something else in a specific way and cooperate.

This sentence says, "There is no interaction by the viewer required or possible in his scheme." So the applicant is saying, "Now, look, you can't take something like what I have shown and combine it with something else when this something like that you are relying on as prior art cannot possibly be interrelated."

There is not only no teaching to do it, it is not physically possible. That goes to the concept of the way you have an unobviousness rejection. If you have elements scattered all over the universe and in references and the examiner says, "Take this from here, this from there, and this from there, and put them together," the applicant's response is, "Well, Mr. Examiner, the only way it can be put together is if you use my teaching."

There is no teaching in the prior art that suggests putting them together and, indeed, it

would be physically impossible to put those things together if you followed the teachings. That is the essence of it.

That one sentence is illustrative of exactly that point.

Q Professor Kayton, as a new art, a new technology develops, do the Patent Office examiners develop unofficial subclasses for their own use? Is that a practice?

A Yes, they do.

Q How is that practice developed or practiced in the Patent Office, if you can just generally describe it?

A There are different ways. Examiners become very knowledgeable with new technology which otherwise might be scattered in various subclasses. They generate their own.

Indeed, I recall one instance where in a patent infringement suit dealing with automobile radiators, the prior art that was selected for the purpose of that suit, some 90 patents, were so intimately related to a particular aspect of automobile radiators that it was used by some examiners as an unofficial classification.

Q In making a search, is it a matter of the examiner's judgment and experience as to the field of search

that he is going to do?

A Yes, of course.

Q In general, how is that field of search determined by the examiner in deciding in a given case where to go?

A He relies upon his expertise. He relies upon the applications that he has prosecuted. It is almost like how you go in and do legal research using the West Index.

You have background. You have knowledge. You start in one area if you can't blanket the whole field. You have a kind of interactive feeling for it.

In addition, he searches anything that is called. If prior art is called to his attention which suggests to him perhaps another category search, he will do that. There is no formal way. It varies widely from examiner to examiner, but the essence of it is their knowledge of the prosecution they have been doing and their technological knowledge.

MR. ANDERSON: No further redirect, your Honor.

MR. GOLDENBERG: We have no questions.

THE COURT: All right, thank you, Professor Kayton. You may stand down.

(Witness excused.)

MR. ANDERSON: Your Honor, Professor Kayton

is our last witness. We have several matters that can be handled without a witness, and I would now turn to those.

MR. GOLDENBERG: Your Honor -- Mr. Anderson, I apologize for interrupting..

MR. ANDERSON: Do you have something other than what I am talking about?

MR. GOLDENBERG: Yes, I have.

Mr. Anderson has indicated he has called his last witness and has other matters he wants to take care of. Mr. William Brown, who is not an employee of ours, is intended to be our first witness. He has taken time off from work.

I believe, sir, that I can complete his examination in relatively short order. I would ask the Court's leave, and with Mr. Anderson's consent if he would be willing to give it --

THE COURT: No objection?

MR. ANDERSON: No objection at all, your Honor.

THE COURT: All right, fine. Why don't we take about a five minute recess here?

(There was a brief recess, after which the following further proceedings were had herein:)

MR. GOLDENBERG: Your Honor, we would like to call William Brown.

(Witness sworn.)

WILLIAM BROWN,

called as a witness by the defendants herein, having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GOLDENBERG:

Q Would you state your name and residence address, please?

A My name is William Brown.

I live in Glenview. Do you want the address in Glenview?

Q Yes, your street address.

A Well, since this is my first experience up here, that has left me.

THE COURT: That is all right. Glenview is good enough.

THE WITNESS: I live on Golf Road, 1260 Golf Road? I can't remember.

BY MR. GOLDENBERG:

Q Are you employed?

A Yes.

Q By whom?

A Cook Electric in Morton Grove.

Q In what capacity, sir?

A My title is a staff engineer. I work with computers, logic design programming.

Q Have you had any education beyond high school, and if so, could you state what that was?

A Yes, I went to the University of Michigan for four years, got a Bachelor's Degree there, graduated in 1951.

Q In what field of specialty was your Bachelor's Degree?

A It was in Engineering Mathematics, I think it was called. They had a category in the Engineering School of Mathematics.

Q Did that include any courses in electrical engineering?

A Yes, that would be like a minor, I suppose. I took a number of courses in electrical engineering.

Q After your graduation from the University of Michigan, what employment did you have?

A I worked for the University of Michigan at Willow Run Research Center. Actually I worked there while I was finishing school in 1951 through October of 1955.

Q In what kind of work were you engaged during this period 1951 through 155?

A After three or four months or so of -- what shall I say? I felt I was reading technical magazines. I found a place there after a few months and got into the project of designing a special purpose computer.

For the rest of the time there I was involved, up until nearly the end, in the design, testing, programming of this computer.

Q Were there other people working on this computer as well?

A Yes, we had a group working on the computer, possibly six people or so.

Q Had the design of the computer commenced prior to your joining the project?

A Possibly slightly. I started to work with an associate that I knew at Michigan, who I believe had started his design. He was also a logic designer. I was not at the time.

I was out of school and had no specific vocation, but that is what I became very quickly. I believe he had had a little headstart on me.

Q Could you state what you did as a logic designer?

A That involves the association, the design, the bringing together of what you might call electronic building blocks, functional units, elementary units to perform a total function of some kind and ultimately to perform the function

that a large scale digital computer performs, in this particular case.

Q Did there come a time when the design of this computer was completed?

A Yes. Would you like me to say when?

Q Approximately when, sir, to the extent that you recall.

A Yes, it seems that I started in the fall of '51, so it would be, I believe, sometime in '53 that I would say the design was completed, possibly the middle of '53.

Q Was there a particular name given to this computer?

A I can't recall exactly when the name appeared, but it was eventually called MIDSAC Computer, M-I-D-S-A-C.

Q Is that an acronymn that stands for something in particular?

A Yes, it had, by the way, a companion computer called MIDAC. That is unimportant.

MIDSAC, MI would be Michigan, Digital Special Purpose Automatic Computer, probably.

To tell you the truth, it wasn't very fancy, nothing very clever. I think we could have done much better.

Q Do you know whether or not this computer was related in anyway to any previously constructed computer by some other institution?

A We used the circuits, the electronic packages --

they were called packages -- of SEEAC, circuits developed at the National Bureau of Standards in Washington.

I was not involved in the designer development. As a matter of fact, I don't know that anyone at Michigan designed and developed the circuits. I just don't know, but basically they were SEEAC circuits.

Q Was the MIDSAC computer being developed under the sponsorship of any agency external to the University of Michigan; do you recall?

A We were under contract with Boeing. I guess that is all right to say, Boeing Airplane Company.

It was a defense contract, classified secret at the time.

Q Could you state generally what the intended purpose of this computer was?

A Generally to control airplanes or missles, that sort of thing. Is that general enough?

Q I believe so. Perhaps you could make it a bit more specific. Were they going to control the flight of these?

A That's what I meant, in flight, yes.

Q Besides, was there a particular name given to this kind of computer, the MIDSAC computer?

A I'm not sure what you have in mind. A name given to this kind of computer?

Q Well, sir, I have in mind the application for which it was intended, that is to say, to control the flight.

A Guidance computer.

Q I'm sorry?

A A guidance computer? I mean --

Q No, sir.

A Well, it was -- it's designed to -- it had to have special characteristics to be able to perform real time control of a multiple number of objects. In this particular case the objects were airplanes or missles in flight. Real time control, it had to be fast.

Q I think, sir, you have answered my question. A real time computer, is that correct?

A Yes, that's the distinction.

Q Could you tell the Court what a real time computer is?

A Well, in those days the computers were typically -- well, weren't nearly as fast as they are today, and they often would perform functions or simulations, and they would operate -- they took longer to perform or to control a process -- it took longer than a real time, than it could normally take in a real time control.

I am not saying that very well.

The function performed might be displayed on graphs, and it might perform a function which actually -- I'm saying the same thing -- took longer than the function itself would take.

As an example, I am thinking about a simulation process where the computer might simulate something, and the computer might take longer to simulate it than the real thing itself.

Well, real time control, of course in a real time control the computer has to be fast enough to operate at the speed of the real world, rather than just a data processor that would compute -- there is quite a distinction there against a computer that was controlling

live events going on.

Q Was a computer delivered to Boeing Aircraft?

A Not ever delivered, to my knowledge.

Q Could you state why, sir?

A Yes. We had one insurmountable problem at the time. We had one unreliable component of the computer, which was a tie speed memory or storage unit. There were electrostat tubes -- Williams tubes, they were called, and we could never make them reliable enough for the application.

Q Do you have any view as to whether or not they were reliable for applications other than the contracted for application?

A Well, yes. That was the problem. The application was a very critical one, and in those days we didn't give any thought -- it would probably be too complicated or expensive to develop redundant systems, as they do nowadays, and a momentary failure could have been -- well, it was unacceptable for the particular application.

Now, there are many applications where computers are used, then and today, where momentary failures are tolerated.

I say momentary, because this type of failure with this type of computer could have been cor-

rected in a very short order, because of the nature of its design. The fact that it had a back up storage where the failed high speed storage could be replenished readily. But even that wasn't good enough for its particular application. It would have been fine for many other applications.

Q Do you know, sir, whether or not there were any -- ever any demonstrations of the capabilities of that computer?

A Yes. We gave a demonstration for a professional group that had a meeting in the Detroit area -- I guess it was in Detroit -- I believe in 1954, and we were called upon to demonstrate both of our computers at Willow Run Research Center. So we developed a demonstration for them.

Q Could you describe what that demonstration was, sir?

A Well, we wanted to demonstrate the nature of the computer, the type of computer that we had built, what it could do. And we came up with the idea of, rather than controlling airplanes, controlling pool balls. We decided to simulate a pool game on a television screen, on a cathode ray tube.

Q Could you explain how this was done, describing the apparatus involved and what was necessary in

order to do it?

A Yes. I will attempt to do that.

It was, in a fairly simple way of looking at it, two of the outputs of the computer were -- that could be called channels -- were outputs which effectively -- the computer operates digitally, discretely, but these outputs were converted, digital quantities to analog quantities.

So we had two analog outputs, so to speak, that could be used to -- well, in this particular case the application was rather good. They could be used to control the horizontal and vertical deflection of a cathode ray tube, and thus to control images on a cathode ray tube.

Q All right. In order to do this, beyond connecting these elements together, what had to be done?

A Well, a program had to be written. This is a stored program computer, and a program had to be written and inserted that would perform the functions that we wanted to perform, that would simulate the pool game.

MR. GOLDENBERG: Your Honor, at this time I would like to hand to the Court Defendants' Exhibit 8. This is a binder containing tabbed documents relating to the pool game about which the witness is testifying.

BY MR. GOLDENBERG:

Q Mr. Brown, I hand you a copy of Defendants' Exhibit 8 and I ask you to direct your attention to the first document in there, which is under tab 1.

MR. ANDERSON: May I have just a copy of the index at least, so I can follow? Thank you.

BY MR. GOLDENBERG:

Q (Continuing) Mr. Brown, do you have that document?

A Yes.

Q Could you say what that is, sir?

A This is a description of the computer, its components, and the set of instructions, input and output devices, a total description of the computer that we have been referring to.

Q I notice a date on that document. Could you state what significance, if any, that date has?

A April 1954?

Q Yes.

A Significance? Well, it was written before that time.

Q How do you know that?

A I just recall that, the document itself, I recall working on it. I wrote a fair part of this myself, and I recall waiting for the document in some anticipation, so I know it was written before this date.

Q Is the original of this document in your custody, sir?

A I have a couple of copies -- is that what you mean -- of the actual document.

Q Yes, sir.

A Yes.

Q How long have you had those?

A Well, since this time, since 1954.

Q All right, sir. I refer you to the documents under tab 2, and I ask you if you can identify those?

A All of the pages I can see are what constitute my original notes and specific machine language program of that pool game I referred to.

Q Could you state who wrote this program, sir?

A The one you are looking at, I did.

Q Was that program used in the demonstration?

A That's correct.

Q You said it was in program language or machine language?

A Machine language.

Q Could you state what that means, sir?

A Well, I suppose looking at the first two or three pages here, the program sheets, the numbers at the right hand, in the right hand column are, I would call them alpha-numeric. That is, this is the machine language I was referring to. It consists strictly of numbers and a few letters, not -- well, these numbers are interpretable rather directly by the computer. And the computer takes in the numbers and examines them, decodes them, in the words we use, and there are numbers in -- each separate line is a separate instruction given to the computer in a time sequence, and the computer decodes the instruction, and the instruction specifies what the computer is to do at that time and where to get its numbers that it operates on, where to go, what to do.

Q Were these number codes directly related to that particular MIDSAC computer?

A Yes. They are unique to this particular computer, but I mean any computer will work -- any digital computer, stored program digital computer, operates on the same basis.

Q Well, would a new program have to be written, or would a program have to be written in a different language for a different computer?

A Yes, typically. The codes would be somewhat different, although you would find the list of instructions -- that is, what can be done is usually much the same, but not exactly the same.

Q All right, sir. I note the last page under tab 2 is headed "Collision Calculation".

A Yes.

Q Could you state what that is, sir?

A Well, this is a diagram and set of equations that describe the directions given to balls in collision, and given their initial directions, the equations show what their final directions will be after impact.

That was the most complicated routine that we had to use, to produce the realistic ball dynamics on the table.

Q All right, sir. I ask you to turn to a document which is about fourth from the bottom of the tab, and it's entitled "Block Diagram of Pool Game Simulation".

A Yes.

Q Could you state what that is?

A Well, yes. In making a program for a computer the usual thing is to -- first of all you make a plan,

the sequence of operations which you are going to perform, and you write it out so that you can see what the flow is.

You generally prepare a block diagram such as this, and then you program from it. It's the map which you use in getting into the detail of expanding on the functions specified in each block. So it gives, if you follow it, it gives the sequence of things that are done in the program.

It's usually, in this kind of an application, it's written in a loop form, because typically a set of instructions is operated on over and over again, and the operation's results are different, depending on some input that is sensed.

Q Did you prepare the document entitled "Block Diagram of Pool Game Simulation"?

A No, I did not.

Q Do you know who did, sir?

A I believe it was an associate of mine named Ted Lewis.

Q Do you know when he prepared it?

A Well, it would be fairly early in this particular development. It would be first of all sometime in '53. Exactly when, I can't say, but it was apparent -- in terms of the effort of getting this program, it

would be done early in that effort, and I think it was probably the summer or fall of '53. The summer.

Q What were the circumstances under which he prepared it, if you know?

A Well, after we decided that we were going to demonstrate a pool game, we had to decide what the functions were that we were going to simulate, what we thought we would do or could do and what we felt we don't do, and then put them together in a logical sequence such as they could be executed by a computer.

And so I think there was several of us that were involved in this planning stage, and this fellow Ted Lewis actually was at that time more involved than the rest of us in getting the program started. I think he did the original program, which didn't work. But I was involved, more involved at that time, with the computer itself.

Q Did there come a time when that situation changed?

A Yes. I was sort of phasing off of checking out the computer as a computer, as a general computer. And particularly when we had some trouble. Basically his program wouldn't fit in our storage.

We had a rather small storage in this particular application, and I have to say that none of us were programmers. But somehow, and I can't remember just exactly what the situation was, but I got the job of seeing if I could make it work, you know.

And I did, but that type of thing is very similar to the other work that I had done in logic design. You use the same king of thinking in both.

Q Did you rewrite Mr. Lewis' program?

A Yes. You can use those words. In some cases there was some rewriting.

Q I would rather have your words, sir.

A Well, in that sort of thing, well, I am sure it wasn't -- this was 20-some years ago, but -- however, I know that in this case there were some of the things that he had done that were satisfactory in other areas that just didn't work at all. In those cases, I would replace what he did.

Q All right, sir.

A If you did it in a straightforward manner, it couldn't be done. It had to be done by tricks, so to speak, and I was good at tricks, and I got it to work in the right size, and that's it.

Q All right, sir. Could you state the circumstances which caused this effort to write this program for this display to commence? Why was that effort undertaken?

A Why did we do this?. Well, we were, our group was charged with providing a demonstration for this group of professional people. ACM? It's a professional programming group. I didn't belong to it. I think they are called ACM,or were. And at any rate, they were meeting in Detroit, which is right close to Ann Arbor, and I don't know how it was brought about that they were going to come out and look over the facilities, but they planned to do this. I guess Michigan was asked to perform some sort of demonstration, and so certain people worked on demonstrations for both customers that we had out there and this was our contribution.

I will admit it seems like a pretty big job. It was. We spent a fair amount of time doing this. And we probably learned a lot, too. But that is the situation.

Q Was the demonstration actually held?

A Yes, yes.

Q How do you know that, sir?

A Well, I was there and played. I said a few

words, I remember, and challenged anyone who wanted to a game of pool. It worked out very nicely.

Q Well, could you describe the apparatus that was demonstrated?

A Well, it was done in the laboratory area where we had the computer. That wasn't movable. And we simply obtained a cathode ray tube with its control.

I say "obtained" it. It was a piece of equipment that was there in the labs. We didn't actually go out and purchase any new equipment for this. We just put together what we had.

And so we obtained this. We were able to obtain this cathode ray tube display, and we had to get a few controls to be able to control such things as the cue stick that was displayed, and be able to control the -- well, there were a few things, like racking the balls and repositioning the cue ball when it scratched, and a few little things like this. We had a few knobs and controls we had to bring together.

And so, what did it look like? I mean the tube was mounted off the floor in a rack of equipment -- an equipment rack, and a few controls were located nearby.

Do you want me to describe the controls?

Q Well, sir, if you could describe it from the

point of view of an observer, an attendee at this demonstration, what would he have seen?

A Yes. Well, we demonstrated what could be done here in a logical sequence. The first thing was --

Q Well, could you describe completely, if you would first, the apparatus visible to the observer? What would he see?

A Well, the computer was, as I say, this was in the laboratory area where the computer stood, so of course he would see the computer. As a matter of fact, part of the description of this was a computer itself, and its input and output. And there were two or three of us that talked at that time and explained what basic, basically what the computer was and what it could do.

And there, by the way, is a picture of all of that here. Is that pertinent?

Q If you could draw our attention to it, it would be helpful.

A Yes, because you can see -- well, in this copy it's very poor, but it shows. This would be tab 1, about five pages into it. There is a figure 1-1, overall view of the MIDSAC computer, that is sort of washed out but might give you some idea of the equipment involved in the computer.

In the foreground there is a desk at which we had a panel of controls and a -- what we called a flexowriter, which is labeled here, which is just like an electric typewriter, which was an input device to the computer where we could actually type in programs. That's one way of entering -- really about the only way we had, as a matter of fact, of entering programs into storage.

And there is a magnetic drum up in the corner. On this picture it's off to the left. You can't see too much.

Anyway, this was the computer, and this was, as you see it in the picture, that was there at the time just like this.

In addition to all of this was this cathode ray tube display.

MR. ANDERSON: Excuse me. What page in the Exhibit?

THE WITNESS: Well, it's called Figure 1-1. Well, it's just before page 1, just after a list of tables right at the beginning. So this was the area that people gathered in this area.

BY MR. GOLDENBERG:

Q Excuse me, sir. In addition to seeing the cathode ray tube, did they see any of these controls

that you mentioned?

A Oh, yes, everything.

All right. Now, besides this computer that we are talking about here now, there were a few wires running over then to another rack in which was situated this cathode ray tube display. I believe, the way I remember, it was actually in back of this thing marked the control console. That was its actual location, sort of out of the way, and so, vertically mounted, was this cathode ray tube, and there were a few controls.

Q Could you describe those controls and what their purpose was?

A Yes, there were several push buttons and knobs and a joy stick type of control. To begin with, we displayed 16 balls as circles on a cathode ray tube and approximately, I think, a 2 inch stick, if you like, which was the cue stick. The cue stick could be positioned anywhere on the screen simply by moving this joy stick because the joy stick gave how much over and how much up, the X and Y positioning, like at the center of it.

Then we had a knob that could point the stick, simply rotate it to give it a direction.

So those controls were used to position the stick behind the cue ball as if you were taking aim and making a shot.

Then there was simply a push button you would push when you wanted to shoot the cue ball. The cue ball would then move in the direction that the stick was pointing.

So much for that.

Before doing all of that, if you are starting the game, there is another button you would push and that would give you an initial setting of all of the balls. So it would show a racked position of 15 balls and the cue ball itself would be on the other end of the table. You would spot just by pushing a button.

Given that, we had set up a direction and positioned the cue stick behind the cue ball. Then we would push this button for starting. The cue ball would then move and presumably you would be pointing it towards the balls in the rack. You would on collision of the cue ball with any ball in the rack begin then to get the total motion of all of the balls as if a ball actually had hit 15 balls in a racked position.

They would move and they would bounce off the edges of the table and if any balls went in the vicinity of a so-called pocket, there being six pockets, it would disappear.

Then there are two things here. One is that when balls would hit rails, they would slow down. We would assume a friction, loss at that time, and also balls rolling would eventually slow down because there is a friction with the table.

So a given shot might take 5 seconds or so and all of the balls would come to a stop, in which case you would then go and with a joy stick maybe the other player then -- it might be his turn -- would then reposition the cue stick behind the cue ball in the direction he wanted it to move, push the button, and you would have your second shot. He would try to hit another ball and deflect it into a pocket.

Q Suppose the cue ball went into a pocket; what would happen?

A It would disappear, and in that case, you could do one of two things: rerack the whole set-up, as I explained before, or there was another button which would simply bring back the cue ball on its spot. You could bring back the cue ball from a scratch and then continue the game from there.

Q Did the positioning of the cue stick in the X and Y position have anything to do actually with the direction in which the cue ball went?

A No, that was simply a nicety for someone that would play the game to get the feeling that the cue stick was behind the cue ball and would hit the cue ball. It had nothing actually to do with the control of the game by the computer.

Q Did the rotation of the cue stick by this other knob have anything to do with the direction in which the cue ball moved?

A That gave it its initial direction, to move. It had everything to do with it. That was an essential input.

Part of the input to the program was the two values obtained from the rotation of the cue stick.

Q Were these knobs controlling potentiometers or something like that?

A Yes, in both cases. The joy stick controls potentiometers and the knob that gives direction controls potentiometers, producing component values. I call them X and Y displacements, so much over, so much up, analog values.

Q What happened to those analog values? How did they get to the computer?

A They have to be converted to a digital number, and the computer had input capabilities for a set of, I think it was, up to sixteen numbers of this sort.

We actually inputted something like -- well, we inputted the X and Y direction to move, and I think that is all that we had to input to the program, was just the initial direction for the cue ball to move.

We had to input signals, switches that said "Go", "Do this", "Do that".

Q Was the game as displayed a realistic kind of game?

A This would be subjective, I suppose. I thought it was very realistic. I was very pleased with its appearance.

The motions of the balls and all were quite realistic, including the directions in collision, which is something we had to work at a little bit to get correct.

It was all as you would expect to see it, except for the fact that the speed of the game was governed by how many balls were moving, which meant that at the break, when the cue ball hit the rack of

balls, they actually broke in slow motion because in this case 16 balls were moving, which represented that the program had to process 16 moving balls, which took long enough so it couldn't be done in what you might call real time.

So it became a slow motion break, which I thought was rather nice because you could follow the break. It was interesting to see where the balls really went. You play pool and you have a break and they go so fast that you can't tell where they were going; but here you could follow them, but that wasn't realistic.

As soon as the balls started to slow down and stop, as soon as they stopped, then the speed became what you might call normal. Any shot you might take after that was normal speed because typically there would be two, three or four balls moving. With those number of balls moving, they moved at normal speed.

Q Do you recall whether or not there were any questions from the audience at this demonstratinn?

A There were a few questions. I am sure there were. I recall that there were questions.

I seem to remember more questions in private than as an audience, if you know what I mean, because after we talked about it, then it got quite informal. Some of those in the audience wanted to play

the game, and we would play it or two people would play.

So naturally we got to talking and there were questions, yes.

Q To the extent that you were yourself asked questions by these attendees at the demonstration, did you answer those questions?

A Well, yes, except I know that several times a question was asked relating to -- I think some of them discerned that this was ridiculous that this computer would play this game and they wanted to know what was it really all for. It was classified and I couldn't answer that question and didn't.

Q Do you recall whether you got any questions about how it worked?

A Yes, I believe so. I mean, here again you are talking about something that took place a long time ago.

Q I understand that, sir.

A I believe that -- you mean how -- well, I believe my recollection of it is that general questions were asked, some relating to the computer as a computer and some relating to the game and, you know, what was happening.

Q Do you have any recollection as to whether or not you answered that kind of question?

A Oh, yes, I went through all of that. There was no classification as to the computer and its parts. The thing that was classified was the specific application, which really means the program, the program that caused the computer to perform its real time guidance control. That was what was classified.

Q I direct your attention in Defendants' Exhibit 8 to the documents under Tab 3, and I ask you to tell us what those documents are, if you can?

A Yes, all of these sheets are copies of flow diagrams, block diagrams, flow diagrams and descriptions of the instructions of the program to control this pool game that I made up, oh, let me see, in March, April, maybe May of last year, 1976.

Q What was the occasion of making those up, sir?

A It was rather a coincidence. I had for some time had these old notes. The old notes are the originals in Section 2. Those are all my old notes, and they were stored away for some time.

Particularly, as a matter of fact, because new microcomputers were being developed and becoming available, a cheap means of obtaining computer control was becoming available, and I had it in the back of my mind that I would sort of like to reconstruct

this pool game. I knew that I had the old program, or I felt I could reconstruct it from the notes I had. I finally just went in and dug out the notes and started to look at them and started to block it out because the notes, frankly, are pretty hard to read.

As a matter of fact, I couldn't probably have done it without the material in Section 1, which is that book describing the computer and its instructions.

But putting it all together, I reconstructed the whole thing. So I wanted to do this because I wanted to see what it was that we did 22-some years ago. I wanted to see if I could -- I knew I could do it again in modern technology.

So this is what I wanted to do, and I was motivated -- well, I got into this and looked at it -- well, I guess that answers the question, doesn't it?

Q Yes, sir. Is there any particular event that happened?

A Well, that is the coincidence.

MR. ANDERSON: Your Honor, I object to the testimony about something that was done within the last year in that this is supposedly prior art that occurred in 1954. I think that anything that happened within the last year is irrelevant and should be excluded as improper.

THE COURT: I don't know whether it will be relevant or not. I will receive it. I will listen to it subject to your objection. If it is immaterial, I will strike it.

BY THE WITNESS:

A Yes, this was the coincidence.

BY MR. GOLDENBERG:

Q Mr. Brown, could you state what the coincidence was?

A The coincidence was that I had started to do this, and within two weeks of that time that I had started -- I think it was in April, March or April -- I got a call and someone had found that I had done this sort of work and they were interested in it in regard to the present T.V. games and possible patent infringements and so forth.

My attention was called to it, and it just happened that I had just started to look at it.

Q You mentioned a microcomputer in connection with this. What is a microcomputer?

MR. ANDERSON: Your Honor, again I think this is modern technology. The witness has testified that after he made these sketches, he was contacted in this litigation, and I submit that whatever work has been done in that time or even thinking about what can or should or might be done today is irrelevant and improper with respect to the alleged 1954 prior art event.

I think to mix them up is improper, and I object.

MR. GOLDENBERG: Your Honor, I think this testimony is relevant to demonstrate that the technology that we deal with today, that we know today, that permits things such as Paddle games and Odyssey games and what have you, really didn't arise out of a vacuum; that this was a history to this technology and these things developed.

Here we have, it seems to me, an instance of that, that here the witness has testified about work with one of the earliest computers, if you will, and how it was used to play a game. I think it is appropriate, if indeed this is his testimony, that that technology could be updated and used with modern

devices to do the same thing, and I think it is appropriate.

MR. ANDERSON: Your Honor, I think my objection is well taken. Mr. Goldenberg has an expert who can fill in those gaps, and I think this witness, who has been called as a fact witness as to events --

THE COURT: No, I regard this as an expert witness in his field.

MR. GOLDENBERG: I am asking him with respect to a fact, your Honor.

MR. ANDERSON: But the facts for which this witness is called are 1954 facts, not 1976 facts.

THE COURT: Experts don't always have to give opinions. Experts can testify to facts, too.

I am going to overrule the objection and give it what weight it is worth. I think your objection goes to the weight rather than the admissibility.

MR. GOLDENBERG: Your Honor, we won't be on this very long, I assure you.

THE COURT: As usual, what was going to be short is not so short.

MR. GOLDENBERG: My intention to complete the examination of this witness is to go through the balance of these documents that we have and these exhibits, and I don't think it will take very long to do that.

THE COURT: How many people were at this demonstration back in 1954?

THE WITNESS: I would say 25 to 50, that magnitude.

MR. GOLDENBERG: Your Honor, in connection with this, there are stipulations with respect to this matter in the agreed statement of facts, which run 91 through 122.

THE COURT: Relating to the demonstration?

MR. GOLDENBERG: Relating to the demonstration, the circumstances under which it was held, the people attending the conference, and what the sponsoring association was.

THE COURT: All right, I read it once, but it tends to fade from memory.

BY MR. GOLDENBERG:

Q All right, sir, I direct your attention to Tab 4 of Defendants' Exhibit 8, and I ask if you can tell me what that is, sir?

A This is a copy of an issue of the Journal, published by this society that was meeting in the Detroit area that came out to see the demonstration.

Q Is the pool game demonstration discussed in that article?

A Yes, there is an article here by two people from Michigan that discusses the demonstrations on those computers,

the pool game being one of them.

Q They are discussing the demonstration you have been testifying about?

A Yes, that starts on page 177 of this.

Q I direct your attention to Tab 5 of the exhibit, and I ask you if you can tell me what that is?

A This is a copy -- oh, yes, I see in the fold there is the actual copy of the front page of the Tribune, June 27, 1954.

There is an article there on the front page describing these demonstrations. It is entitled "Meet MIDAC and MIDSAC Dice Pool Shooting Fools" in the center.

MR. GOLDENBERG: Your Honor, what we have done there is to provide a typewritten version of the text of the article because it is not otherwise legible.

THE COURT: All right.

BY MR. GOLDENBERG:

Q Mr. Brown, I direct your attention to Tab 6 and ask if you can tell us what is included under that tab?

A Let's see, 6. This is one of the periodicals that provides information on the development of computers, and it happens to be one that gives specifications for our computer, the MIDSAC.

Q All right, sir, what about Tab 7?

A It is another magazine which also happens to have a description of MIDSAC computer. All of these are about the same time.

MR. GOLDENBERG: Your Honor, the last tab, Tab 8, I do not believe is an article that the witness has seen before, but it was one whose authenticity has been stipulated between the parties.

It describes the meeting of the Association for Computing Machinery in Detroit and makes reference to the demonstration of MIDAC and MIDSAC computers at Willow Run Research Center.

THE COURT: All right.

MR. GOLDENBERG: We have no further questions, your Honor.

THE COURT: All right.

CROSS-EXAMINATION

BY MR. ANDERSON:

Q Mr. Brown, I think you indicated that Fig. 11 of

Exhibit 1 is a picture of the MIDSAC computer which was used for the pool demonstration?

A That is correct, yes.

Q There are what appear to be maybe 8 racks of equipment displayed across the picture, each one having -- or 7 of them having a specific label applied to them.

Are those electronic equipment racks?

A Yes.

Q Is each one of those something in excess of a foot and a half wide?

A The width would be 30 inches, I think.

Q For each one?

A For each rack, yes.

Q So the total length of the computer used to demonstrate pool was roughly 3 times 8 or 240 inches?

A 20 feet, something like that.

Q 20 feet?

A On that order, I think.

Q How deep were those racks?

A On the order of 15 inches, I would say.

Q You indicated that the pool program was necessarily put into the MIDSAC by typing it in on the flexo-writer typewriter?

A Yes, that was the input facility that we had, typing, or it could be put on punched paper tape and read in.

Q So there was a tape reader in addition to the flexo-writer?

A The flexo-writer has a tape reader mounted on it.

Q The display unit that you say was used with the MIDSAC computer to demonstrate pool is not shown in this photograph?

A That is correct.

Q I think you said that was behind somewhere?

A Yes, my remembrance is that it was located actually behind this control counsel to the left, out of the picture, and it wasn't there at the time the picture was taken, of course.

Q Approximately how much area was around the computer display counsel in the room? How big was the room, in other words?

A There wasn't a lot of room back there. I think you are looking at three-fourths of the area that you see here and maybe one-fourth that you don't see.

Q You said that 25 to 50 people saw the demonstration. That is what you just said, I believe.

A Yes, on that order.

Q Were they all in the room at the same time then or did they have to see it in shifts?

A We could easily get 50 people in this room.

My hesitancy on the number is that they were

drifting a bit. You see, they had two computers to see and I didn't count them as they went by. So I am not sure that there really were maybe 50 people at the time, but 50 people could sit in this area.

Q What was the approximate cost of this MIDSAC computer?

A Let me think a minute. The cost, would you be asking me the developmental cost or the cost of the parts?

Q The developmental cost first.

A I believe it was in excess of half a million dollars.

Q What was the actual cost, if you know, of the parts and the time involved in actually designing and building the one unit that was constructed? Was that the half a million dollars?

A Yes, I say in excess of a half million dollars but I really don't know how high it went. It probably was somewhere between there and a million.

Q Is it my understanding that sometime after this demonstration the MIDSAC computer was actually junked?

A I guess you could say that.

It was put away into storage and, to my knowledge, not used again.

Q It never did perform its intended purpose?

A That's correct.

Q With respect to the demonstration, it is my understanding that the cathode ray tube that you used for the demonstration was not a normal part of the computer. That was brought in just for the demonstration?

A That is correct, yes.

Q Am I correct that I think you at the beginning of your direct testimony referred to that as a T.V. tube. Was this a T.V. tube?

A Well, no, if I said that, I probably shouldn't have. I was trying to use a popular name there.

I would prefer to call it a cathode ray tube. It was a tube that was similar to laboratory cathode ray tubes used for instrumentation analyses and so forth in the lab, except it was bigger than most of those.

Q In your understanding, then, what is there about a TV tube that is different, that makes a TV tube different?

A When you mention TV tube, I suppose you think of what, TV programs and so forth?

W ll, I would say that so-called TV tubes and instrumentation tubes are all cathode ray tubes. They are all constructed similarly to the eye, but there are subtle differences.

I am not an electronics technician and I can't really get into it. If you were to ask whether the tube that we used could display video, it, of course, could; but it was not taken out of someone's house. It was a laboratory instrument.

Q As you employed this cathode ray tube, it did not have a raster scan, is that correct?

A It was not a raster scan type of tube.

Q It was not that type of tube?

A That is correct, it was horizontal and vertical control of the beam.

Q This was to locate the beam but not to continuously scan it in lines down the picture to make a field, is that correct?

A That is correct. You could say there was a scan, but the scan was completely determined by the

computer program.

You could consider it a random scan, if you like.

Q When you say random scan, does that mean that depending on where the balls were --

A It would go from ball to ball.

Q It would go from ball to ball so if ball 1 were in the upper left-hand corner, it would put a spot there, or a circle?

A A circle, yes.

Q If ball 2 were in the lower left-hand corner, it would then go down there and make a circle?

A Correct.

Q Then if ball 3 were right in the center, the scan would go back to the center and make a circle?

A Correct.

Q It would in no sense make lines continuously and illuminate them depending upon any timed information that was being fed to that CRT?

A That is correct.

Q There were no horizontal or vertical sync signals used in that display of any kind, is that correct?

A Correct.

Q There was no sawtooth for generating horizontal sweep or vertical sweep?

A Not for sweep control. We had sawtooth circuits for generating the circle -- well, it was some kind of analog pulse generator or waveform generator that generated the circle.

Q That was not to sweep the screen, but just to make the beam go around in a circle, actually?

A A symbol generator, yes. In this case the symbol was a circle.

Not for sweeping the screen, no.

Q When you processed the information, is it my understanding that the computer processed the information as to one ball, and based on the equations of motion calculated where that ball had gone since the last calculation was performed?

A Yes.

Q After that calculation was performed, am I correct that data was taken out of a memory location in the computer and used to locate the X and Y deflection of the display and then make a little circle at the right place?

A That is correct.

Q Then after that was all completed, the computer went back and processed the data as to the next ball and pulled that data out of the memory location and told the X-Y deflection where it should be and then made a

little circle for that?

A Yes.

Q How long did it take to call out the data for the 16 balls, one at a time, set up the X-Y display, this point plotting display, and make a circle? How long did it take to do that for 16 balls?

A In case they were all moving -- would you like that?

Q All right, take that as the first case.

A Because that was the slow motion case. I believe that was on the order of 120 milliseconds or so.

Give me a second here.

I believe it was in the order of a little over a tenth of a second.

Q About an eighth of a second if it was 120, I suppose?

A Yes, yes, 125 would be an eighth of a second. On that order if they were all moving.

Q So the most rapidly you could perform this process of pulling the information out about each ball and then displaying each ball one at a time would be an eighth of a second to show 16 balls, is that right?

A I believe that is about right, yes.

Q Do you know what the persistence is on a television screen, by any chance, the time at which

you can continue to have the display?

A Depending on the phosphor, there is quite a range there. If you are asking what it was for the one we were using, I don't really know.

Q I was asking about a TV tube in contrast to the one you were using.

A I don't really know.

Q Do you know what it was for the screen that you were using, the CRT that you used?

A No, you are in an area that I am not really cognizant of. Of course, I do know that there is a variation, depending on the phosphor.

Q In any event, you could not refresh your picture if all the balls were moving more than 8 times a second, is that right, approximately?

A If that is a very important figure, I made some calculations a little while back and I think I wrote a couple of them down here. Could I just sort of double check that?

Q All right, and would you point out where you are looking?

A Yes, that would have to be in Section 2, I believe, and I am going to leaf through here.

It seems to me I made a few -- no, no, that is Section 3. I am wrong.

Section 3, because I reviewed that to come up with some figures.

Q Tab 3 you are looking at?

A In Tab 3, and I have some tables here. I am looking now at a table that if I counted from Tab 4, I would count back 5 pages, and the 6th page back from Tab 4 also has some calculations that I made.

In estimating what these times were, there are two tables, one on each of the two pages. You may notice numbers there where I count from 1 to 16. I am counting the number of milliseconds there, and I see in one table I have 105 milliseconds.

So I guess I am pretty close to what I said. That is the way I seem to remember it.

Q These are the calculations you just did in the spring of '76?

A These are calculations to refresh my memory from my old notes. My old notes didn't have all these figures in them. So I had to do some calculations to help myself remember what I had done at that time.

Q So your recent calculations reaffirm your recollection that it would be roughly a tenth to an eighth of a second to display --

A In the worst case, yes, on the break.

Q -- all of the picture?

A Yes, right.

Q If you wanted to keep refreshing it, you could only refresh it roughly 10 times a second, is that correct?

A That is true.

Q If that were a movie projector, that would give you a very discomforting flashing appearance?

A It would be a flicker; that is right, that would be quite a flicker.

Q That was the best that this half a million dollar computer could do at the time?

A Well, it was doing an awful lot, by golly, when it was doing that.

May I say one thing? What we say, what I have said and what you say is true, but you are focusing on a very brief instance of the whole game, which I would have to make some apology for; but once you get by that break, the rest of the game is one where you typically have two to four balls moving and you have quite a different thing there.

Q If it is going at the rate that you have discussed at the time of the break when all the balls are moving, how much of a slowdown was there? Did it slow down to half of the speed or a quarter of the speed?

A It was a factor of 5 or 6.

Q 5 or 6 to 1; it was 5 or 6 times as close to normal in one case as in the other?

A Yes, on the break it was quite slow motion. It was just the fact that the computer was a very fast computer but nevertheless, it had to perform thousands of calculations.

Q In this demonstration, there was no use of any kind of horizontal sync pulses and timing data information with respect to it, is that correct?

A Okay, you are speaking of timing?

Q In other words, in a T.V. set.

A Timing circuits, not for controlling the horizontal and vertical deflect.

Q All right. Now, with respect to the demonstration that the participants saw, as I understood your testimony, to start the demonstration in motion he just pressed a button and then he sat back and watched the balls move around on the screen; am I correct?

A Yes. That's to begin the motion.

Q Right. And there was no way that he -- that in any demonstration that you did on the MIDSAC computer of any game, where you were moving player symbols around, of trying to, in an active relationship, intercept the balls or make the balls change their direction once the button was pressed, is that correct?

A Once the button was pressed, it was entirely under the control of the computer program, which had to sense various coincidences between balls and cushions, or edges of the table, yes.

Q Once the button was pushed it was under computer control; the player had absolutely no control over the motion of the balls or any other activity on the screen; is that true?

A That's true.

Q Now, you referred to the sides of the table?

A Yes.

Q Were they a part of the visible display that the x-y CRT generated?

A No.

Q They were not a part of the lighted display on the screen?

A That's correct.

Q How were they placed on the screen?

A I believe we used grease pencils to outline them, and the pockets.

Q So there were no pockets displayed on the screen? That was all done externally with grease pencils?

A That is correct.

Q Now, you have referred in your direct testimony to page 9 of Brown Exhibit 2, which is Tab 2, I believe, in your book?

A Yes.

Q And I think that you have testified here that that was prepared by another gentleman in your group, Ted Lewis, is that correct?

A Well, I'm not sure which page you are looking at now.

Q Page 9.

A Page 9 of tab 2?

Q Page 9 of tab 2.

A And this is the block diagram?

Q Yes.

A Yes, another fellow prepared this block diagram, yes.

Q And did you say this is a block diagram of what was actually done, or one of the predecessors that didn't work?

A A predecessor that didn't work.

Q So page 9 of tab 2 does not represent the game as you finally worked it out, but a predecessor game that did not function?

A That's correct.

Q Now, on page 9 of tab 2, is that some sort of a flow chart or tracing one collision, or what is it?

A Well, it is meant to describe all of the functions and the order in which they are performed by the computer, so it would include the totality of functions in sequence.

Q And this totality, as shown in page 9, is that for checking one ball for its motion and its contact with other balls in order to generate in the computer the information to put one of the balls on the display, to make up one portion of the total display?

A Well, if I understand you, this shows a looping, so that it gives it for all balls by simply going back in a loop and going through this box 16 times.

Q So you would go through this complete box of

logical operations 16 times in order to have the computer perform the operations to put 16 balls on the screen to make one refreshed display?

A There is a loop here which you can go through 16 times, but it's not the whole page. It's a loop. If I can scan this here, I think it's on the right hand. It's the right-hand loop, but it's the bottom part of the right-hand loop. That line is -- I think basically it's the entire right-hand loop minus a couple of boxes, which you would repeat 16 times.

I want to point out that the right-hand loop is the motion loop, and the left-hand loop is what I call the set-up loop.

Just a minute, now. This isn't my diagram, and I think I may have right and left confused here. I do. It's the left-hand loop that is the motion loop and the right-hand loop is the set-up loop where all of the instructions are there, which are used to position, you know, the direction, the cue stick direction, and rerack the balls, and that sort of thing. That's the set up.

Q I see. Now, with respect to the cue stick, am I correct in your testimony that the joy stick controlled the X-Y location of the cue stick as it appeared on the screen of the CRT?

A Yes.

Q And am I also correct that it made absolutely no difference in the play of the game where on the screen that cue stick was located; it could be in any corner, the middle, or anywhere?

A It could be.

Q And in fact, the joy stick was not connected to the computer at all; it just was a little X-Y technique for putting a line on the screen?

A Yes.

THE COURT: What does "X-Y" mean here?

MR. ANDERSON: Your HOnor, in normal mathematical parlance, X is the horizontal axis of a graph and Y is the vertical graph, and I think throughout the litigation X-Y means the kind of display that we have just talked about.

Perhaps, are you familiar with that term, Mr. Brown, X-Y display?

THE WITNESS: Yes. Yes. It is as he said. Two numbers with specified location in a horizontal and vertical grid, how much over and how much

up.

THE COURT: Okay.

BY MR. ANDERSON:

Q And is it common to refer to a display such as you use as a point plotting display or an X-Y display? Are you familiar with both of those terms?

A You mean are they synonymous, so to speak?

Q Yes.

A I would say so.

Q And they are in contrast to a scanning display that makes a continuous picture by making continuous lines?

A The scanning technique is a technique where timing circuits are involved. You know how fast you are scanning, and therefore at a certain instant in time you display a cue ball or whatever.

Q Right. And now that was not involved in any way in your display of the pool demonstration, is that correct?

A I didn't do it that way.

Q You didn't do it that way.

Now, I think you said that Ted Lewis you thought worked on this unsuccessful program on page 9 of tab 2 in the summer or fall of 1953.

A It probably was the fall of '53, but it was

an earlier activity, yes.

Q Was that the earliest attempts that you made to demonstrate pool on the MIDSAC computer, or did your work go back even earlier than that?

A For that particular demonstration?

Q For any pool demonstration?

A All right. As I recall, it was the fall of '53 that we started this, and it was the first in our --

Q And I think you said something else occurred in April or so of '53 that you personally did in preparing for the pool demonstration. What was that?

A Well, the April '53 -- now, I mentioned March or April of '73 at the time that I started doing this reconstruction. Do you think I said something about '53?

Q '54. I'm sorry. '54 perhaps you said.

A '54? I don't recall.

Q Well, the demonstration only occurred on one occasion, is that right?

A Yes. That was in the summer of '54.

Q In June?

A June, I believe it was.

Q In June of 1954?

A Yes.

Q Now, just roughly, how many man hours would

you say were invested in working up this pool demonstration between you and Mr. Ted Lewis and any of the others who worked on it to make the equipment that was necessary in addition to the MIDSAC computer and write the program and rewrite it and get it corrected so that it would work?

A Well, I wonder how I can answer that. I don't really know. It was a part time effort, of course. We spent, I think we spent some period on the order of six months or so, maybe a little more, in this development of this pool game, maybe 7 or 8 months. And therefore, then I have to estimate just how much of the time we worked on it as opposed to other things that we did, and I am somewhat at a loss to make an estimate. I would -- I suppose I could guess that it represented as much as a man working continuously for that period of time, which then comes up to six or eight man months, and it's probably that kind of thing. It might be as much as one man year.

Q Now, with respect to the cue stick again, I have asked you about the noncriticality of locating it. With respect to its position and location, its angle, I think you said there was a knob that was provided to rotate the apparent angle of the cue stick, is that correct?

A Yes

Q Did the cue stick have a distinguishable working end from the handle end, if that's the right term?

A No. A center. It was rotated about a center.

Q There was nothing to distinguish one end from the other?

A I see what you mean. Well, I do not recall it as a symbol, being that you could distinguish one end from the other.

Q So it's approximately just really almost like -- not even like a compass needle which has a north and a south, but a line which rotated to indicate an angle that corresponds to the angle you had twisted the knob, and that also was fed into the computer for information about the initial travel of the cue ball; is that about the way it worked?

A Yes.

Q So it was really just an angle indicator, the cue stick, as you call it?

A Yes. It produced two values again, so much over and so much off an X-Y value or direction for the cue ball to start moving when you pushed the button.

Q Now, you said that somebody, or several people asked you if it wasn't silly to use a computer for this purpose. Why did they ask you that, do you know?

A Well, I am simply saying that they came to see this demonstration, and with regard to questions, my recollection is

there were questions partly on the computer, because they were fairly new at that time, a lot of people had never seen a computer. So there were questions on the computer and questions on the game and then questions relating to the two of them. I seem to recall at least someone thinking that here we built this computer for this game, which was ridiculous.

Q I think you said this meeting, this demonstration was for an association of computer programmers.

A Yes. It's their journal. I never can remember that.

Q Well, Brown Exhibit 4, which is Tab 4, is the Journal of Association for Computer Machinery.

A That is the one, ACM.

Q And did those people indicate they had never seen a computer?

A The people that were there were for the most part familiar with computer. I recall a reference too -- you mean in regards to what I said when I said with regards to asking about a computer because they had never seen one?

Q Yes.

A I think you caught me on that, because these people should have been familiar with computers, although I do believe that even people such as these, there would be some of them that were not too familiar with computers equipment-wise. They were programmers. They were not computer engineers, and a lot of

them knew very little about -- and even nowadays know very little about what a computer is. Programming and, you know, how a computer works are quite different things.

Q Now, with respect to this slowdown of 5 or 6 times, reduced by 5 or 6 times to a 5th or a 6th of the original speed, is that because the computer was just plain saturated; it was overworked and it didn't have the time to perform the calculations and have the display?

A When all the balls were moving, yes, the computer was operating as fast as it could.

MR. ANDERSON: Your Honor, I have no further cross-examination.

THE COURT: All right.

REDIRECT EXAMINATION

BY MR. GOLDENBERG:

Q Mr. Brown, when all balls were being displayed and moving slowly, could an observer see all the balls?

A Oh, yes.

Q He still saw the 16 balls?

A Absolutely, yes.

Q What did he observe about them?

A The 16 balls, when they were moving?

Q Yes.

A Well, what did he observe? He observed that they -- that the balls apparently moved in straight lines and reflected or collided off of each other and off of the walls in a normal expected fashion.

I'm not sure what you are getting at.

Q Well, I think you have answered my question, sir.

Suppose you had set out to have a game where you were just going to display three or four balls. Would that problem of slow motion have existed?

A No. And it did not. When three or four balls were moving, they moved at the proper rate.

MR. GOLDENBERG: I have no further questions.

MR. ANDERSON: No further recross, your Honor.

THE COURT: Thank you. You may be excused.

(Witness excused.)

THE COURT: Well, there is no way we are going to finish this case by Thursday evening, I can tell you that. You can tell me that.

MR. ANDERSON: Your Honor, if it won't take -- we will not take more than 15 or 20 minutes in the morning. I'll be happy to finish tonight if Mr. Goldenberg and the Court would.

THE COURT: I think we have had enough.

MR. GOLDENBERG: Your Honor, I will move as quickly as I can.

THE COURT: I am not being critical. I was never any better when I tried cases at estimating time. Lawyers always underestimate, and I think they do so in good faith. It's not possible to really know. My wife says I do it chronically in everything. So --

MR. GOLDENBERG: Perhaps your Honor will also recall that plaintiffs always contrive, intentionally or unintentionally, to underestimate.

THE COURT: Well, especially a plaintiff who is anxious to get to trial, he has always got a very short case.

MR. ANDERSON: I believe we are still coming short of what we had originally estimated, both sides, your Honor, with due respect.

MR. GOLDENBERG: Is your Honor going to have court on Friday?

THE COURT: Yes. Well, I am going to have court on Friday, but I have got two other matters that I have scheduled, one for the morning, I have got a sanity hearing on a criminal defendant in the morning, and then I have got a hearing on motion to suppress in a criminal case in the afternoon. Now, I gather that the morning matter will take all morning. The afternoon matter may not take all afternoon.

MR. GOLDENBERG: All right, sir. My Cleveland situation, which I mentioned earlier, Judge Manos put that matter over, but I'm afraid he put it over to Friday afternoon.

THE COURT: Give him my best regards. Judge Manos and I were schoolmates in September, we went to school for Federal Judges. A very fine man.

MR. ANDERSON: He has my case that took me to London for three weeks.

THE COURT: Oh, is that right?

You were saying, Mr. Goldenberg, --

MR. GOLDENBERG: So I am presently scheduled in at Judge Manos' court Friday afternoon.

THE COURT: Oh, I see. Go ahead and do that, because the small likelihood that I would have any time

left over is not sufficient to cause any change in that situation. I think what we may do, this case that is starting Monday involves lawyers who come from Milwaukee and they are already grousing about having to come down here from Milwaukee for half a day on Wednesdays, and they have asked me if they could try the case in four days. What I may do is give them the opportunity the first of the week in an attempt to finish up in one or two Wednesdays, so you might have that in mind. That's what I am going to have to do, because I am entering a series of trials here all of which are long and there is no way I could put this case over until the completion of any other trial, because they are all so long, once I start any of them it's a matter of not getting back to you for a month.

So I don't want to do that. It's hard enough to remember this material from day to day.

So let's take up tomorrow at 10:00 o'clock, and we will go to 1:00 o'clock, 10:00 to 1:00 tomorrow. Okay.

(Whereupon the trial of the above-entitled cause was adjourned to Wednesday, January 5, 1976 at 10:00 o'clock a.m.)

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